In the claims:

Please amend the claims as follows:

1. (Original) A room-temperature source of polarized single photons, the source comprising:

a substrate;

a single light-emitting dye molecule or other, single fluorescence emitter; and

a planar aligned liquid crystal host, disposed on the substrate, the light-emitting dye or other fluorescence emitter being embedded in the host, for aligning molecules of the light-emitting dye or other fluorescence emitters along a preferred direction.

2. (Original) The source of claim 1, wherein the host comprises a monomeric, nematic liquid crystal or monomeric, nematic liquid-crystal mixtures.

3. (Original) The source of claim 2, wherein the host is a chiral host.

4. (Original) The source of claim 2, wherein the host comprises a chiral additive.

5. (Original) The source of claim 2, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or other fluorescence emitter.

6. (Original) The source of claim 1, wherein the preferred direction is a direction which maximizes the excitation efficiency of the light-emitting dye or of the other fluorescence emitter.

7. (Original) The source of claim 1, wherein the host is an oxygen-depleted liquid crystal host.

8. (Original) The source of claim 1, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

9. (Original) The source of claim 8, wherein the host comprises biphenyl or therphenyl liquid crystals or mixture of biphenyl or therphenyl liquid crystals.

10. (Original) The source of claim 8, wherein the single light-emitting dye molecules comprise a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

11. (Original) The source of claim 8, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

12. (Original) The source of claim 11, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

13. (Original) The source of claim 8, wherein the other fluorescent emitter comprises a trivalent rare-earth chelate.

14. (Original) The source of claim 1, wherein the host comprises an oligomeric or polymeric liquid crystal or a mixture of oligomeric or polymeric liquid crystals.

15. (Original) The source of claim 14 wherein the host comprises a nematic liquid crystal.

16. (Original) The source of claim 14, wherein the host comprises a chiral liquid crystal.

17. (Original) The source of claim 15, wherein the host further comprises a chiral additive.

18. (Original) The source of claim 14, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or other fluorescence emitter.

19. (Original) The source of claim 14, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

20. (Original) The source of claim 19, wherein the single light-emitting dye molecules comprise a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

21. (Original) The source of claim 19, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

22. (Original) The source of claim 21, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

23. (Original) The source of claim 19, wherein the other fluorescent emitter comprises a trivalent rare-earth chelate.

24. (Original) A method for preparing a room-temperature source of single photons, the method comprising:

(a) preparing a substrate;

(b) preparing a planar aligned liquid crystal host, disposed on the substrate, for aligning single molecules of a light-emitting dye or other single fluorescence emitter along a preferred direction; and

(c) embedding the light-emitting single dye molecules or other single fluorescence emitters in the host.

25. (Original) The method of claim 24, wherein step (a) comprises shearing the substrate.

26. (Original) The method of claim 24, wherein step (a) comprises mechanically buffing the substrate.

27. (Original) The method of claim 26, wherein the substrate is buffed by applying a polymer to the substrate by spin coating the substrate in a solution of the polymer and mechanically buffing the polymer.

28. (Original) The method of claim 27, wherein the polymer comprises Nylon-6.

29. (Original) The method of claim 27, wherein the polymer comprises polyimid.

30. (Original) The method of claim 24, wherein step (a) comprises photoaligning the substrate.

31. (Original) The method of claim 30, wherein the substrate is photoaligned by coating the substrate with a photoalignment polymer and photoaligning the photoalignment polymer.

32. (Original) The method of claim 31, wherein the photoalignment polymer is photoaligned using linearly polarized ultraviolet light.

33. (Original) The method of claim 24, wherein the host comprises a monomeric, nematic liquid crystal or monomeric, nematic liquid-crystal mixtures.

34. (Original) The method of claim 24, wherein the host is a chiral host.

35. (Original) The method of claim 24, wherein the host comprises a chiral additive.

36. (Original) The method of claim 24, wherein the host is a monomeric chiral host or mixture of monomeric chiral hosts.

37. (Original) The method of claim 33, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

38. (Original) The method of claim 24, wherein the preferred direction is a direction which maximizes the excitation efficiency of the light-emitting dye or of the other fluorescence emitter.

39. (Original) The method of claim 24, wherein step (b) comprises oxygen-depleting the host.

40. (Original) The method of claim 39, wherein the host is oxygen-depleted by treating the host to displace molecular oxygen dissolved in the host with another gas.

41. (Original) The method of claim 40, wherein the other gas comprises helium, argon, or nitrogen.

42. (Original) The method of claim 24, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

43. (Original) The method of claim 42, wherein the light-emitting dye comprises a dye selected from the group consisting of terrylene. rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

44. (Original) The method of claim 42, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

45. (Original) The method of claim 44, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

46. (Original) The method of claim 42, wherein the other fluorescence emitter comprises a trivalent rare-earth chelate.

47. (Original) The method of claim 33, wherein the monomeric liquid-crystal or mixture of monomeric liquid crystals is disposed between two of said substrates by

a. placing not fewer than three spacer bars around the edge of a first one of said substrates and affixing said spacer bars to a surface of said first one of said substrates by adhesive;

b. making a liquid crystal cell from said two substrates;

c. spreading a liquid crystal of said monomeric or mixture of monomeric inside said cell.

48. (Original) The method of claim 24, wherein the host comprises an oligomeric or polymeric liquid crystal or a mixture of oligomeric or polymeric liquid crystals.

49. (Original) The method of claim 48, wherein the host comprises a nematic oligomeric or polymeric liquid crystal or mixture of oligomeric or polymeric liquid crystals resulting in a predominantly nematic phase.

50. (Original) The method of claim 48, wherein the host further comprises a chiral additive.

51. (Original) The method of claim 48, wherein the host comprises a chiral oligomeric or polymeric liquid crystal or mixture of chiral oligomeric or chiral polymeric liquid crystals.

52. (Original) The method of claim 48, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

53. (Original) The method of claim 48, wherein the host is oxygen depleted by treating the host to displace molecular oxygen dissolved in the host with another gas.

54. (Original) The method of claim 53, wherein the host is dissolved in a solvent.

55. (Original) The method of claim 54, wherein the other gas is helium, argon, or nitrogen and the mixture is filtered, in order to remove particulate introduced by the displacement of the molecular oxygen and/or other particulate.

56. (Original) The method of claim 48, wherein the light-emitting dye or other fluorescence emitter is doped into the host in solution form, the solvents of the host and the solvent of the dopant being miscible within one another.

57. (Original) The method of claim 48, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

58. (Original) The method of claim 57, wherein the light-emitting dye comprises a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

59. (Original) The method of claim 57, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

60. (Original) The method of claim 59, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

61. (Original) The method of claim 57, wherein the other fluorescence emitter comprises a trivalent rare-earth chelate.

62. (Original) The method of claim 56, wherein the oxygen-depleted host is dried from solvents by vacuum distillation to powdery dryness.

63. (Original) The method of claim 62, wherein the liquid-crystal oligomer or polymer or mixture of liquid-crystal oligomers or polymers is disposed between two of said substrates by

a. placing not fewer than three spacer bars around the edge of a first one of said substrates and affixing said spacer bars to a first surface of said first one of said substrates by adhesive;

b. spreading a layer of said oligomer or polymer powder on said first suface;

c. placing a first side of a second one of said substrates first side on the liquid-crystal powder layer to form a substrate liquid-crystal sandwich;

d. heating said sandwich for 10 to 30 minutes to a melting and clearing temperature of the liquid-crystal host;

e. shearing the liquid-crystal host by parallel motion relative to each other of the two substrates along the plane over distances of millimeters in a forward-backward motion sequence; and

f. slowly cooling said sandwich at rest until room temperature is reached.

64. (Original) A device for emitting polarized single photons, the source comprising:

a photon source comprising: two substrates; a single molecule of light-emitting dye or other single fluorescence emitter; and a planar aligned liquid crystal host, disposed between the substrates, the light-emitting dye or other fluorescence emitter being embedded in the host, for aligning molecules of the light-emitting dye or of the other fluorescence emitter along a preferred direction;

a light source of preferred polarization state for causing excitation light to be incident on a portion of the photon source to excite one single emitter at a time to emit the polarized single photons;

means for collecting emitted photons in a controlled manner; and

means for discriminating excitation light from emitted light.

65. (Original) The device of claim 64, wherein the exciting light source comprises a laser.

66. (Original) The device of claim 65 wherein the laser is either CW or pulsed.

67. (Original) The device of claim 65 wherein the laser wavelength is inside an absorption band or a two/three photon absorption band of the dye or the other emitter.

68. (Original) The device of claim 64, wherein the exciting light source further comprises an objective lens for focusing the excitation light from the laser onto the portion of the photon source.

69. (Original) The device of claim 64, wherein the host is a liquid-crystal host with a room- or near-room-temperature mesophase.

70. (Original) The device of claim 69, wherein the liquid-crystal host is an oxygen-depleted liquid crystal.

71. (Original) The device of claim 69, wherein the liquid-crystal host is a monomeric liquid crystal or a monomeric, liquid-crystal mixture.

72. (Original) The device of claim 71, wherein the liquid crystal is nematic.

73. (Original) The device of claim 71, wherein the host is a chiral liquid crystal

74. (Original) The device of claim 71, wherein the host further comprises a chiral additive.

75. (Original) The device of claim 71, wherein the host is a planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

76. (Original) The device of claim 64, wherein the preferred direction is a direction which maximizes the excitation efficiency of the light-emitting dye or of the other fluorescence emitter.

77. (Original) The device of claim 71, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

78. (Original) The device of claim 77, wherein the single light-emitting dye molecule comprises a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

79. (Original) The device of claim 77, wherein the other single fluorescence emitter comprises a core-shell semiconductor nanocrystal.

80. (Original) The device of claim 79, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

81. (Original) The device of claim 77, wherein the other single fluorescence emitter comprises a trivalent rare-earth chelate.

82. (Original) The device of claim 71, wherein the host comprises a biphenyl or terphenyl liquid crystal or a mixture of monomeric biphenyl or terphenyl liquid crystals.

83. (Original) The device of claim 64, wherein the host comprises an oligomeric or polymeric liquid crystal or a mixture of oligomeric or polymeric liquid crystals.

84. (Original) The device of claim 83, wherein the host comprises a nematic oligomeric or nematic polymeric liquid crystal.

85. (Original) The device of claim 83, wherein the host comprises a chiral oligomeric or chiral polymeric liquid crystal.

86. (Original) The device of claim 83, wherein the host further comprises a chiral additive.

87. (Original) The device of claim 83, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

88. (Original) The device of claim 83, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

89. (Original) The device of claim 88, wherein the light-emitting dye comprises a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

90. (Original) The device of claim 88, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

91. (Original) The device of claim 90, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

92. (Original) The device of claim 88, wherein the other fluorescence emitter comprises a trivalent rare-earth chelate.

93. (Original) The device of claim 64, wherein the means for collecting emitted photons in a controlled manner comprises a reflective or refractive optical element collimating light from a point source.

94. (Original) The device of claim 64, wherein the means for discriminating emitted light from excitation light comprises a plane-parallel absorbing-glass filter, multilayer dielectric-thin-film stack or stacks, or a reflective or transmissive diffractive element.

95. (Original) A method for producing polarized single photons, the method comprising:

(a) providing a source which comprises a substrate, single molecules of a light-emitting dye or other single fluorescent emitters and a planar aligned liquid crystal host, disposed on the substrate, the light-emitting dye or other fluorescence emitter being embedded in the host, for aligning molecules of the light-emitting dye or the other fluorescence emitter along a preferred direction;

(b) providing a light source for causing polarized excitation light to be incident on a portion of the photon source to excite, at any one time, one and only one dye molecule or other fluorescence emitter to emit the polarized single photons; and

(c) discriminating the emitted light from the excitation light.

96. (Original) The method of claim 95, wherein the host is a liquid crystal disposed in a substrate/liquid-crystal/substrate sandwich structure.

97. (Original) The method of claim 95, wherein the host comprises a monomeric, liquid crystal or monomeric, liquid-crystal mixtures.

98. (Original) The method of claim 97, wherein the host comprises a nematic liquid crystal.

99. (Original) The method of claim 97, wherein the host is a chiral host.

100. (Original) The method of claim 97, wherein the host comprises a chiral additive.

101. (Original) The method of claim 95, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

102. (Original) The method of claim 95, wherein the preferred direction is a direction which maximizes an excitation efficiency of the light-emitting dye or of the other fluorescence emitter.

103. (Original) The method of claim 97, wherein host comprises oxygen-depleted host.

104. (Original) The method of claim 103, wherein the host is oxygen-depleted by treating the host to displace molecular oxygen dissolved in the host with another gas.

105. (Original) The method of claim 104, wherein the other gas comprises helium, argon, or nitrogen.

106. (Original) The method of claim 95, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

107. (Original) The method of claim 106, wherein the light-emitting dye comprises a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiI_{18}(3)$, and $DiI_{18}(5)$.

108. (Original) The method of claim 106, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

109. (Original) The method of claim 108, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

110. (Original) The method of claim 106, wherein the other fluorescence emitter comprises a trivalent rare-earth chelate.

111. (Original) The method of claim 95, wherein the host comprises an oligomeric or polymeric liquid crystal or a mixture of oligomeric or polymeric liquid crystals.

112. (Original) The method of claim 111, wherein the host comprises a nematic oligomerics or nematic polymeric liquid crystal or mixture of oligomeric or polymeric liquid crystals resulting in a predominantly nematic phase.

113. (Original) The method of claim 111, wherein the host further comprises a chiral additive.

114. (Original) The method of claim 111, wherein the host comprises a chiral oligomeric or polymeric liquid crystal or mixture of chiral oligomeric or chiral polymeric liquid crystals.

115. (Original) The method of claim 111, wherein the host is planar aligned and/or has a 1-D photonic band gap tuned to a chromophore fluorescence band of the light-emitting dye or of the other fluorescence emitter.

116. (Original) The method of claim 95, wherein the preferred direction is a direction which maximizes the excitation efficiency of the light-emitting dye or of the other fluorescence emitter.

117. (Original) The method of claim 111, wherein the host is oxygen depleted by treating the host to displace dissolved molecular oxygen in the host with another gas.

118. (Original) The method of claim 117, wherein the other gas is helium, argon, or nitrogen and the mixture is filtered, in order to remove particulate introduced by displacement of the molecular oxygen and/or other particulate.

119. (Original) The method of claim 111, wherein the light-emitting dye or other fluorescence emitter belongs to the group of compounds exhibiting sufficient solubility in the host at or near room temperature.

120. (Original) The method of claim 119, wherein the light-emitting dye comprises a dye selected from the group consisting of terrylene, rhodamine, or a rhodamine derivative, Alexa Fluor, $DiIC_{18}(3)$, and $DiIC_{18}(5)$.

121. (Original) The method of claim 119, wherein the other fluorescence emitter comprises a core-shell semiconductor nanocrystal.

122. (Original) The method of claim 121, wherein the semiconductor nanocrystal comprises PbSe, CdTe, PbS, or CdS as core material.

123. (Original) The method of claim 119, wherein the other fluorescence emitter comprises a trivalent rare-earth chelate.

124. (Original) The method of claim 95, in which the polarized excitation light is focussed by a reflective or transmissive focussing element into the liquid-crystal layer of the substrate/liquid-crystal/substrate sandwich such that the focal volume intercepts one and only one dye molecule or other fluorescence emitter.

125. (Original) The method of claim 95, comprising translating laterally the substrate/liquid-crystal/substrate sandwich such that whenever a single dye molecule or

other single fluorescence emitter irreversibly photobleaches, another single emitter can be moved into the excitation-light focal volume.

126. (Original) The method of claim 95, wherein the reflective or transmissive focussing element is also the optical element collecting the emitted light.

127. (New) The source of claim 1, wherein the source is a source of deterministically polarized single photons.